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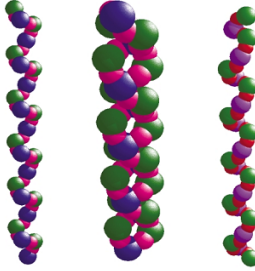
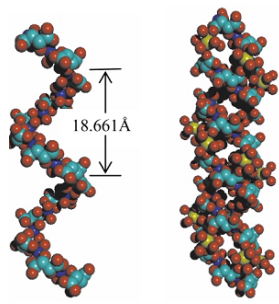
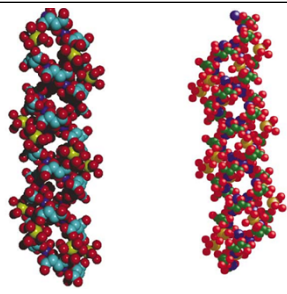
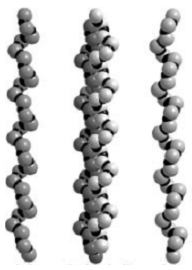
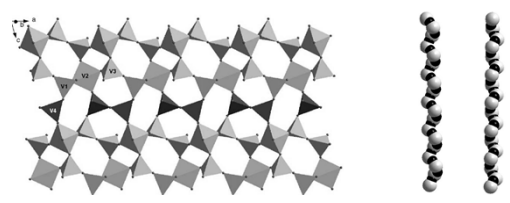
**Coexistence of Interconnected and Interweaved Double Helixes
in an Octamolybdate-based Compound: Synthesis, Structure,
and Photocatalytic Properties†**

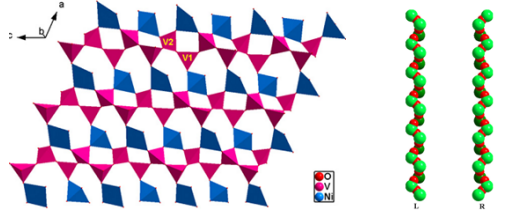
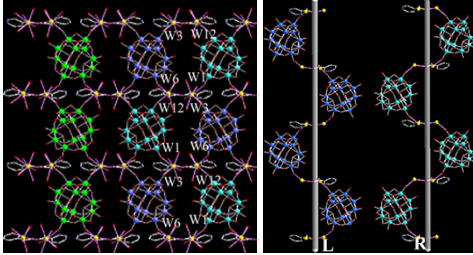
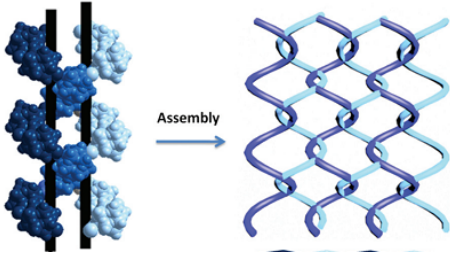
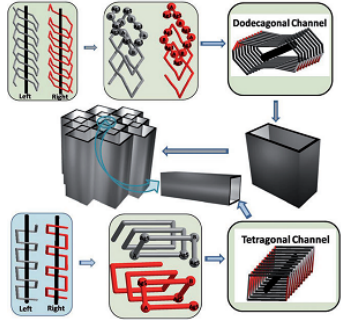
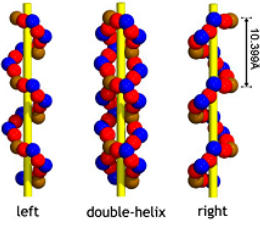
Wenlong Sun, Chunjing Zhang, Huiyuan Ma*, Haijun Pang* and Shaobin Li

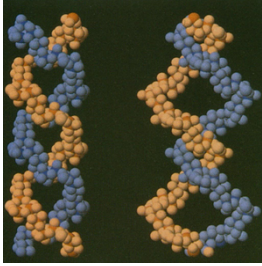
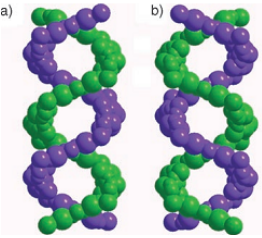
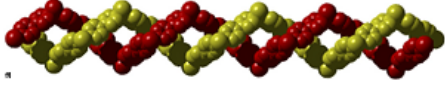
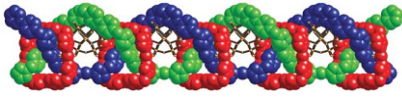
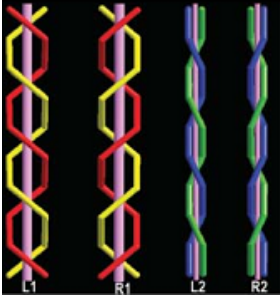
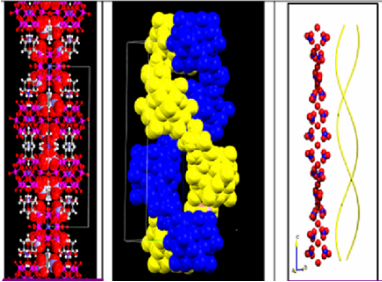
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Table S1 Summarization of known double helical compounds based on POMs towards a specific disposition in I and/or II types.

Compounds and structures	types	References
 <p>$[\text{Cu}_2\text{Mo}_2\text{O}_8(4,4\text{-bpy})]_n \cdot 3n\text{H}_2\text{O}$</p>	I	<p><i>Lu et al.</i> Chem. Commun. 2002, 152–153</p>
 <p>$[\text{NH}_4][\text{Mo}_2\text{O}_4\text{Gd}(\text{H}_2\text{O})_6(\text{L-C}_4\text{H}_2\text{O}_6)_2] \cdot 4\text{H}_2\text{O}$</p>	I	<p><i>Lu et al.</i> Chem. Commun. 2003, 1284–1285</p>
 <p>$\{\text{A}[\text{Mo}_2^{\text{VI}}\text{O}_4\text{Ln}^{\text{III}}(\text{H}_2\text{O})_6(\text{C}_4\text{H}_2\text{O}_6)_2] \cdot 4\text{H}_2\text{O}\}_n$</p>	I	<p><i>Lu et al.</i> Dalton Trans. 2003, 3192–3198</p>
 <p>$[\{\text{Co}^{\text{III}}(\text{phen})_2\}_2\text{V}_8\text{O}_{23}]$</p>	I	<p><i>Wang et al.</i> Eur. J. Inorg. Chem. 2004, 1385–1388</p>
 <p>$[\{\text{Zn}(2,2\text{-bpy})\}_2\text{V}_8\text{O}_{21}]$</p>	I	<p><i>Wang et al.</i> J. Mol. Struct. 2004, 691,123–131</p>

 <p>[Ni(phen)H₂O][V₂O₆]</p>	I	<p><i>Wang et al.</i> J.Mol.Struct. 2007,840, 53–58</p>
 <p>[(C₆H₅NO₂)Ln(H₂O)₅]₂[H₂W₁₂O₄₀]₂·nH₂O</p>	I	<p><i>Chen et al.</i> Inorg. Chim. Acta 2008, 361, 2508-2514</p>
 <p>Na[Ag₆(pyttz)₂(H₂O)][PMo₁₂O₄₀]</p>	I	<p><i>Yan et al.</i> Dalton Trans. 2013, 42, 7803–7809</p>
 <p>K[Ag₁₄(pyttz)₄(H₂O)₄][HSiW₁₂O₄₀]₂·H₂O K[Ag₁₄(pyttz)₄(H₂O)₂][PW₁₂O₄₀]₂·(OH)·5H₂O</p>	I	<p><i>Yan et al.</i> Chem. Asian J. 2013, 8, 2254–2261</p>
 <p>[Co(bimb)V₂O₆]</p>	I	<p><i>Ma et al.</i> Inorg. Chem. 2014, 53, 4541–4547</p>

 <p>[[CH₃)₂NH₂]K₄[V₁₀O₁₀(H₂O)₂(OH)₄(PO₄)₇]·4 H₂O</p>	II	<p><i>Haushalter and Zubieta et al.</i> Science 1993, 259, 1596-1599</p>
 <p>KH₂[(C₅H₈NO₂)₄(H₂O)Cu₃][BW₁₂O₄₀]·5H₂O</p>	II	<p><i>Wang and Su et al.</i> Angew. Chem. Int. Ed. 2005, 44, 1–5</p>
 <p>(bpy)[Zn(4,4-bpy)₂]₂[H₄CIV₁₆O₃₈]·6H₂O and (bpy)[Co(4,4-bpy)₂]₂[H₄CIV₁₆O₃₈]·6H₂O</p>	II	<p><i>Peng et al.</i> J.Mol.Struct. 827, (2007), 50–55</p>
 <p>[Cu^{II}(L)₂(H₂O)₂][Cu^I₂(L)₂]PMO₁₂O₄₀</p>	II	<p><i>Wang and Su et al.</i> Chem. Commun. 2007, 4245–4247</p>
 <p>[Cu(H₂O)₂]₂H₂[Cu₈(dap)₄(H₂O)₂(α-B-GeW₉O₃₄)₂]</p>	II	<p><i>Yang et al.</i> Chem. Commun. 2008, 570–572</p>
 <p>[Co(H₂O)₆][C₅H₆N]H₄[CoW₁₂O₄₀]NO₃·3H₂O</p>	II	<p><i>Ali et al.</i> Polyhedron 2014, 68, 265–271</p>

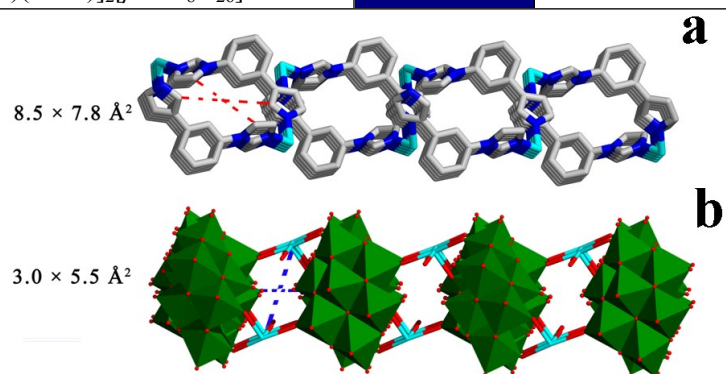
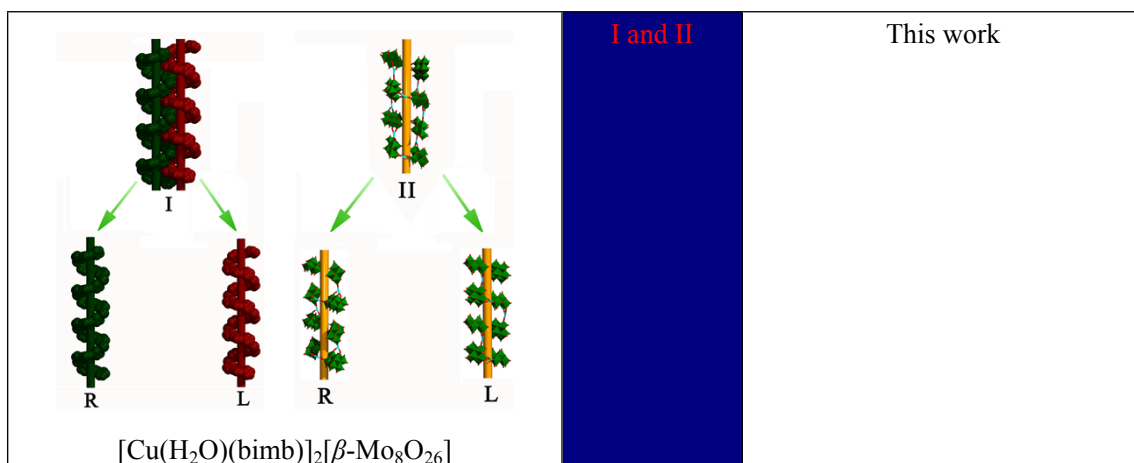


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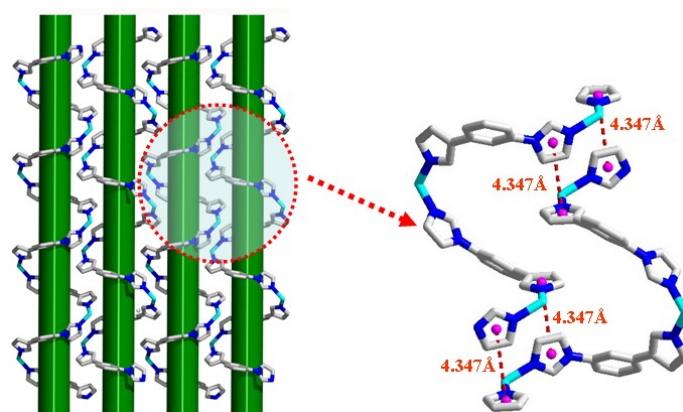


Fig. S2. Detailed view of the $\pi \cdots \pi$ interactions in the inorganic-organic supramolecular layer.

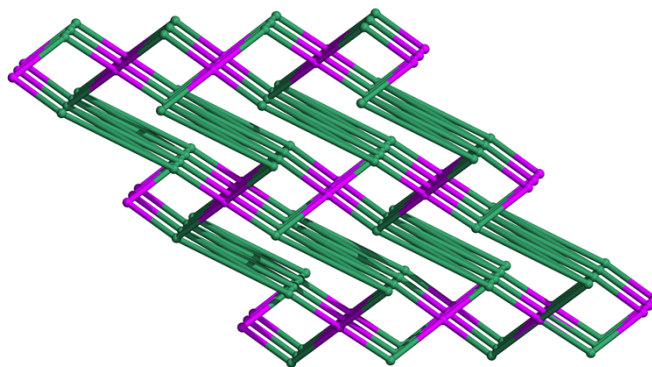


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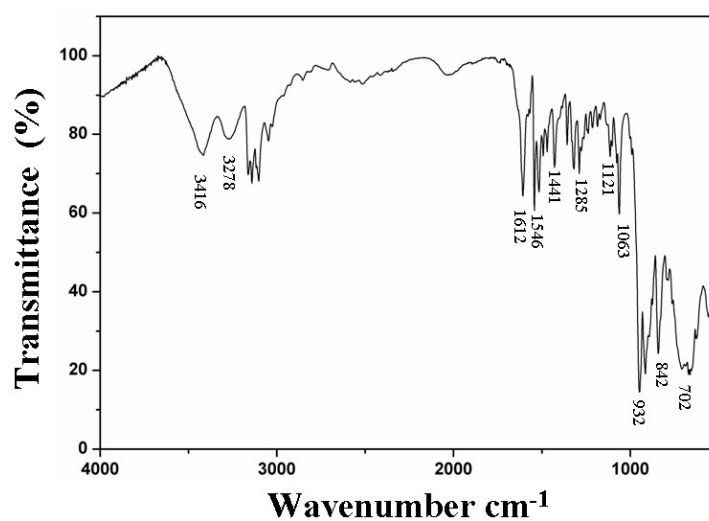


Fig. S4. IR spectrum of **1**.

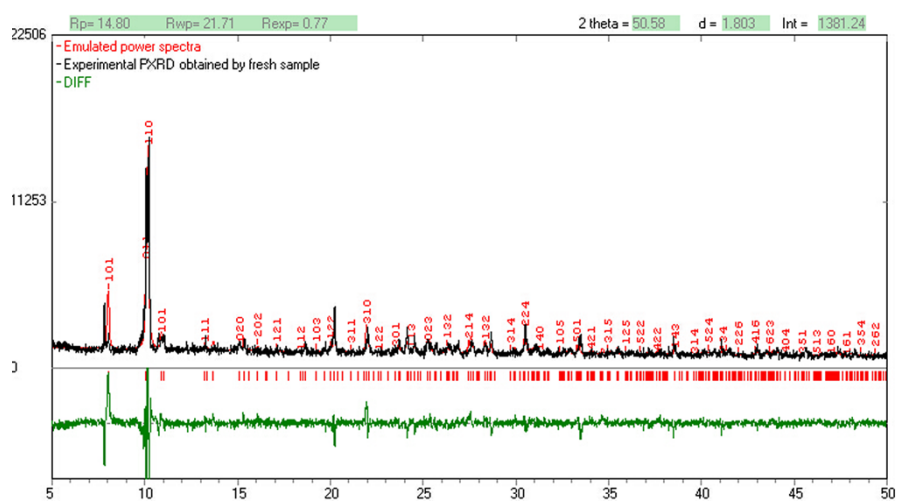


Fig. S5 Output of a calculated powder X-ray patterns by *POWDER CELL*.